

# DEPARTMENT OF HORTICULTURE AND LANDSCAPE ARCHITECTURE



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Professor Amy Charkowski, Acting Department Head

## Undergraduate Majors

- Environmental Horticulture (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/environmental-horticulture-major/>)
  - Landscape Design and Contracting Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/environmental-major-design-contracting-concentration/>)
  - Nursery and Landscape Management Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/environmental-major-nursery-management-concentration/>)
  - Turf Management Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/environmental-major-turf-management-concentration/>)
- Horticulture (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-major/>)
  - Controlled Environment Horticulture Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-major-controlled-environment-horticulture-concentration/>)
  - Horticultural Business Management Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-major-business-management-concentration/>)
  - Horticultural Food Crops Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-major-food-crops-concentration/>)

[sciences/horticulture-landscape-architecture/horticulture-major-food-crops-concentration/](http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-major-food-crops-concentration/))

- Horticultural Science Concentration (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-major-science-concentration/>)
- Landscape Architecture (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/landscape-architecture-major/>)

## Minors

A minor will serve to broaden the academic background of students seeking employment in interdisciplinary job markets associated with plant sciences or the art and science of environmental horticulture. A minor will allow students a maximum breadth and depth in the field while utilizing a limited number of requirements.

- Environmental Horticulture (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/environmental-horticulture-minor/>)
- Horticulture (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/horticulture-minor/>)

## Graduate Graduate Programs in Horticulture

The department offers graduate programs leading to Master of Science and Doctor of Philosophy degrees. Students interested in graduate work should refer to the Graduate and Professional Bulletin (<http://catalog.colostate.edu/general-catalog/graduate-bulletin/>) and the Department of Horticulture (<https://agsci.colostate.edu/hortla/>).

## Certificates

- Horticulture and Human Health (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/graduate-certificate-horticulture-human-health/>)
- Urban Agriculture (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/graduate-certificate-urban-agriculture/>)

## Master's Programs

- Master of Science in Horticulture, Plan A\*
- Master of Science in Horticulture, Plan B\*
- Master of Science in Horticulture, Horticulture and Human Health Specialization, Plan B (<http://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/horticulture-landscape-architecture/master-science-horticulture-human-health-specialization-plan-b/>)

## Ph.D.

- Ph.D. in Horticulture\*

\* Please see department for program of study.

## Courses

Subjects in this department include: Horticulture (HORT) and Landscape Architecture (LAND).

## Horticulture (HORT)

### HORT 100 Horticultural Science Credits: 4 (3-2-0)

**Course Description:** Principles of plant science and related disciplines as the base and context for the introduction of horticultural practices.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory.

Required field trips. Sections may be offered: Online.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**Additional Information:** Biological & Physical Sciences 3A.

### HORT 110 Landscape Design and Contracting Pathways Credit: 1 (1-0-0)

**Course Description:** An exploration of the Landscape Design, Build, and Manage project delivery system. Offers orientation to on-campus resources, for career development, scholarships, academic success, and advising.

**Prerequisite:** None.

**Restriction:** Must be a: Undergraduate.

**Registration Information:** Credit not allowed for both HORT 110 and HORT 180A3.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

### HORT 171 Environmental Issues in Agriculture (GT-SS3) Credits: 3 (2-0-1)

**Also Offered As:** SOCR 171.

**Course Description:** Historical development of agriculture; environmental consequences of modern food production and other cultural approaches to agriculture.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and recitation. Credit not allowed for both HORT 171 and SOCR 171.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**Additional Information:** 1C, Human Behavior, Culture, or Social Frameworks (GT-SS3).

### HORT 192 Orientation to Horticulture/Landscape Arch Credit: 1 (0-0-1)

**Also Offered As:** LAND 192.

**Course Description:** First year course in horticulture and landscape architecture. Information and skills necessary to succeed in majors in the Department of Horticulture and Landscape Architecture.

**Prerequisite:** None.

**Restriction:** Must be a: Undergraduate.

**Registration Information:** This is a partial semester course. Credit not allowed for both HORT 192 and LAND 192.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

### HORT 221 Landscape Plants Credits: 4 (2-4-0)

**Course Description:** Identification, landscape features, cultural requirements, and landscape use of coniferous and deciduous trees and shrubs, vines, and evergreens.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory. Required field trips.

**Terms Offered:** Fall, Spring.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** Yes.

### HORT 231 Landscape Graphics Studio Credits: 4 (2-4-0)

**Course Description:** Use a combination of hand and digital media techniques to produce plan, section, elevation, and 3D views for landscape design concepts. Manual drafting techniques, pencil/marker rendering, drawing professional standards, AutoCad, Photoshop, 3D modeling software and rendering software are all utilized as tools. Map personal workflows to develop drawings that convey the intent of a landscape design while developing personal style.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

### HORT 232 Principles of Landscape Design Credits: 4 (2-4-0)

**Course Description:** Basic concepts in the art and process of landscape design.

**Prerequisite:** HORT 231.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

### HORT 260 Plant Propagation Credits: 4 (3-2-0)

**Course Description:** Theories, principles, and techniques of sexual and asexual propagation.

**Prerequisite:** BZ 120, may be taken concurrently or HORT 100, may be taken concurrently or LIFE 103, may be taken concurrently.

**Registration Information:** Must register for lecture and laboratory.

Sections may be offered: Online.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

### HORT 270 Fundamentals of Horticultural Therapy Credits: 2 (2-0-0)

**Course Description:** Theory and practice of horticultural therapy in health care and human services; applications, settings, and professional career topics.

**Prerequisite:** None.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 310 Greenhouse Management Credits: 4 (3-2-0)**

**Course Description:** Cover the principles of greenhouse management for the production of floral and vegetable crops. Includes the design and use of enclosed structures to manipulate the environment, use of environmental control systems to optimize crop productivity, and proper management and marketing of crops. Intended for professionals in the greenhouse industry only.

**Prerequisite:** HORT 100.

**Registration Information:** Must register for lecture and laboratory. Sections may be offered: Online.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 321 Nursery Production and Management Credits: 4 (3-2-0)**

**Course Description:** Nursery industry organization, management, equipment, field and container production, storage, shipping, marketing, and business management practices.

**Prerequisite:** BZ 120 or HORT 100 or LIFE 103.

**Registration Information:** Must register for lecture and laboratory. Required field trips.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**HORT 322 Herbaceous Plants Credits: 3 (2-2-0)**

**Course Description:** Identification, landscape features, cultural requirements, and uses of ornamental annual, perennial, and bulb plants.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory. Sections may be offered: Online. Required field trips.

**Term Offered:** Fall.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** Yes.

**HORT 325 Native Plants in the Landscape Credits: 3 (3-0-0)**

**Course Description:** Evaluate the diversity of native annuals, perennials, ornamental grasses, and woody plants suitable for use in landscapes in North America. Selection and maintenance characteristics are discussed.

**Prerequisite:** HORT 100 or LAND 110.

**Registration Information:** Offered as an online course only. Credit not allowed for both HORT 325 and HORT 380A3.

**Term Offered:** Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 330 Computers for Landscape Design Credits: 2 (1-2-0)**

**Course Description:** Applications and techniques of computer software utilized in small-scale landscape design-build.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 331 Landscape Design Credits: 2 (2-0-0)**

**Course Description:** Fundamentals of landscape design theory and plant composition as presented in simple problems.

**Prerequisite:** None.

**Registration Information:** For non-design majors only.

**Term Offered:** Spring.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** No.

**HORT 335 Landscape Structures Credits: 4 (2-4-0)**

**Course Description:** Design and construction methods for structures commonly used in residential landscaping. Preparation of construction documents.

**Prerequisite:** CON 131 and HORT 232.

**Registration Information:** Must register for lecture and laboratory. Required field trips.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 336 Landscape Grading and Drainage Studio Credits: 4 (2-4-0)**

**Course Description:** Basic design principles for grading, drainage, and earth forms for small-scale projects.

**Prerequisite:** (HORT 221 and HORT 322 and HORT 335) and (MATH 118 or MATH 120 or MATH 127).

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** No.

**HORT 341 Turfgrass Management Credits: 3 (2-2-0)**

**Course Description:** Principles and practices of turfgrass propagation and maintenance.

**Prerequisite:** HORT 100, may be taken concurrently.

**Registration Information:** Must register for lecture and laboratory.

Required field trips.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 344 Organic Greenhouse Production Credit: 1 (1-0-0)**

**Course Description:** Fundamentals of greenhouse production using organic production methods.

**Prerequisite:** HORT 310.

**Term Offered:** Spring (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**HORT 345 Diagnosis and Treatment in Organic Fields Credits: 2 (0-4-0)**

**Also Offered As:** SOCR 345.

**Course Description:** Field experience in diagnosis of pest and nutrient problems on organic farms and development of treatment recommendations.

**Prerequisite:** (BSPM 302 or BSPM 308 or BSPM 361) and (HORT 100 or SOCR 100) and (SOCR 240).

**Registration Information:** Credit not allowed for both HORT 345 and SOCR 345. Required field trips.

**Term Offered:** Summer (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**HORT 347 Hydroponics Credits: 3 (3-0-0)**

**Course Description:** Hydroponics, hydroponic systems, and hydroponic process from concept to application.

**Prerequisite:** HORT 100.

**Registration Information:** Offered as an online course only.

**Term Offered:** Spring (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 367 Landscape Irrigation Credits: 3 (2-2-0)**

**Course Description:** Practical design of sprinkler and trickle irrigation systems for commercial and residential landscapes.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory. Credit allowed for only one of the following: HORT 367, HORT 368, LAND 368.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 368 Landscape Irrigation and Water Conservation Credits: 3 (2-2-0)**

**Also Offered As:** LAND 368.

**Course Description:** Practical approaches and methods of irrigation, water conservation, and water management in the designed landscape.

**Prerequisite:** HORT 100 or LAND 110.

**Registration Information:** Must register for lecture and laboratory. Credit allowed for only one of the following: HORT 367, HORT 368, LAND 368.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 370 Landscape Irrigation Credit: 1 (1-0-0)**

**Course Description:** Necessary skills to design and manage irrigation systems used in the landscape industry.

**Prerequisite:** HORT 100, may be taken concurrently.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 384 Supervised College Teaching Credits: Var[1-5] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Registration Information:** A maximum of 10 combined credits for all 384 and 484 courses are counted towards graduation requirements.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 401 Medicinal and Value-Added Uses of Plants Credits: 3 (3-0-0)**

**Course Description:** Chemical, biochemical and ethnobotanical perspective on the medicinal and value-added uses of plants.

**Prerequisite:** BZ 120 or HORT 100 or LIFE 103.

**Registration Information:** Sections may be offered: Online.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 410 Postharvest Biology and Technology Credits: 3 (3-0-0)**

**Course Description:** Storage and quality maintenance of harvested fruits and vegetables.

**Prerequisite:** BZ 120 or HORT 100 or LIFE 103.

**Registration Information:** Offered as an online course only. Credit not allowed for both HORT 410 and HORT 481A1.

**Terms Offered:** Fall, Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 412 Floriculture Crops Credits: 4 (3-0-1)**

**Course Description:** Commercial production and marketing of bedding plants, potted container crops, and cut flowers.

**Prerequisite:** HORT 100.

**Registration Information:** Must register for lecture and recitation. Required field trips. Sections may be offered: Online.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**HORT 417 Indoor Crop Production and Physiology Credits: 3 (2-2-0)**

**Course Description:** Advanced principles and practices specific to the production of horticultural crops in controlled environments. Explore strategies for the management of environmental factors (e.g., light intensity, spectrum, temperature, relative humidity, carbon dioxide) and the resulting impact on plant growth and development. Review recent advancements in research and technology specific to production in controlled environments.

**Prerequisite:** HORT 310.

**Registration Information:** Must register for lecture and laboratory. Sections may be offered: Online.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 421 Horticultural Therapy Techniques Credits: 2 (2-0-0)**

**Course Description:** Clinical skills in horticultural therapy; communication, safety, leadership, therapeutic relationships, adaptation of tools and activities.

**Prerequisite:** HORT 270.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 423 Horticultural Therapy Programming Credits: 2 (2-0-0)**

**Course Description:** Methods for individual treatment planning, intervention, documentation, and reporting within therapy, social, and vocational HT programs.

**Prerequisite:** HORT 421.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 424 Topics in Organic Agriculture Credits: 3 (3-0-0)**

**Also Offered As:** SOCR 424.

**Course Description:** Examination of issues specific to organic food production systems, marketing, and policy.

**Prerequisite:** HORT 100 or SOCR 100.

**Registration Information:** Sections may be offered: Online. Credit not allowed for both SOCR 424 and HORT 424.

**Term Offered:** Spring (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 425 Horticultural Therapy Management Credits: 3 (2-0-1)**

**Course Description:** Horticultural therapy program and site design, proposals, funding, marketing, management, and evaluation.

**Prerequisite:** HORT 423.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.



**HORT 431 Planting Design Studio Credits: 4 (2-4-0)**

**Course Description:** Functional and aesthetic values of plant materials; their creative use in landscape design.

**Prerequisite:** HORT 221 and HORT 336 and HORT 322.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** No.

**HORT 432 Intensive Landscape Design Studio Credits: 5 (2-6-0)**

**Course Description:** Site planning and design for landscape projects of a limited scale. Problems of increasing complexity. Emphasis on real sites and clients.

**Prerequisite:** HORT 487 and HORT 431.

**Registration Information:** Must register for lecture and laboratory.

Required field trips.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 441 Turfgrass Science Credits: 3 (3-0-0)**

**Course Description:** Examination of turfgrass management practices from a scientific perspective; discussion of advanced turfgrass management technologies.

**Prerequisite:** BZ 120 or HORT 100 or SOCR 240.

**Registration Information:** Required field trips. Sections may be offered: Online.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 451 Vegetable Crop Management Credits: 3 (2-0-1)**

**Course Description:** Physiological, environmental, and cultural aspects of vegetable crop production, including conventional and certified organic approaches.

**Prerequisite:** BZ 120 or BZ 440 or HORT 100 or LIFE 103 or SOCR 100.

**Registration Information:** Must register for lecture and recitation.

Sections may be offered: Online. Credit allowed for only one of the following: HORT 450A, HORT 451, or HORT 480A2. Credit allowed for only one of the following: HORT 450B, HORT 451, or HORT 480A2.

**Term Offered:** Fall (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**HORT 453 Principles of Fruit Crop Management Credits: 3 (2-0-1)**

**Course Description:** Understanding the fundamentals of fruit tree biology is essential to making sound orchard management and business decisions in the tree fruit industry. Explore the basics of tree and small fruit production, including site, cultivar and rootstock selection, cropping trends and cultural practices such as planting, pruning, training, irrigation, nutrition, harvesting, and postharvest handling and technology of specific temperate fruit crops.

**Prerequisite:** BZ 120 or BZ 440 or HORT 100 or LIFE 103 or SOCR 100.

**Registration Information:** Sections may be offered: Online. Credit not allowed for both HORT 450C and HORT 453. Credit not allowed for both HORT 450D and HORT 453.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 454 Horticulture Crop Production and Management Credits: 2 (2-0-0)**

**Course Description:** Business plan development for production and management of horticultural crops as well as professional development opportunities including job search, meeting select professionals, and resume development.

**Prerequisite:** HORT 310 or HORT 451 or HORT 453.

**Registration Information:** Sections may be offered: Online.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 460 Plant Breeding and Biotechnology Credits: 3 (2-0-1)**

**Also Offered As:** SOCR 460.

**Course Description:** Theory and practice of plant breeding and biotechnology using principles of genetics and related sciences.

**Prerequisite:** BZ 350 or LIFE 201A or SOCR 330.

**Registration Information:** Must register for lecture and recitation.

Sections may be offered: Online. Required field trips. Credit not allowed for both HORT 460 and SOCR 460.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 462 Viticulture Practices in Grape Production Credits: 3 (3-0-0)**

**Course Description:** Biology of grapevines and vineyard management including planting, training, pest control, pruning, and harvesting; special emphasis on Colorado.

**Prerequisite:** BZ 120 or HORT 100 or LIFE 103 or SOCR 100.

**Restriction:** Must be a: Undergraduate.

**Registration Information:** Offered as an online course only.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 464A Arboriculture Credits: 3 (2-2-0)**

**Course Description:** Principles and practices used by professionals to cultivate and manage individual trees and shrubs in developed landscapes, primarily for the health and wellbeing of nearby communities.

**Prerequisite:** HORT 100.

**Registration Information:** Must register for lecture and laboratory. Credit not allowed for both HORT 464A and HORT 464B.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**HORT 465 Landscape Estimating Credits: 3 (2-2-0)**

**Course Description:** Landscape construction estimating and bidding, contract documentation and other business practices relevant to landscape design-build and contracting.

**Prerequisite:** (HORT 221) and (MATH 117 and MATH 118 and MATH 124 or MATH 120 or MATH 125 or MATH 127 or MATH 141 or MATH 155).

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** No.

**HORT 466 Urban and Community Forestry Credits: 3 (3-0-0)**

**Also Offered As:** F 466.

**Course Description:** Policies and management of publicly and privately owned community forests in urbanized areas.

**Prerequisite:** F 310 or RS 310 or HORT 221.

**Registration Information:** Credit not allowed for both HORT 466 and F 466.

**Term Offered:** Fall (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 476 Environmental Plant Stress Physiology Credits: 3 (3-0-0)**

**Course Description:** Plant growth, development and physiology, major sources of stress in plants, global issues in environment and plant stress.

**Prerequisite:** BZ 440.

**Registration Information:** Credit not allowed for both HORT 476 and HORT 576. Sections may be offered: Online.

**Term Offered:** Spring (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 479 Professional Landscape Practices Credits: 2 (2-0-0)**

**Course Description:** Business skills involved in a successful career in the green industry.

**Prerequisite:** HORT 100 and HORT 465.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 486A Practicum: Floriculture Credits: 2 (0-4-0)**

**Course Description:** Directed experience in applications of floriculture technique. Fall: pest, energy, and production. Spring: production and experimentation.

**Prerequisite:** HORT 310.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 486B Practicum: General Credits: Var[1-6] (0-0-0)**

**Course Description:** Directed experiences in applications of horticulture techniques and procedures.

**Prerequisite:** None.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 487 Internship Credits: Var[1-18] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Registration Information:** Sections may be offered: Online.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 495 Independent Study Credits: Var[1-18] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 496 Group Study Credits: Var[1-18] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 500 Graduate Student Professional Development Credits: 3 (3-0-0)**

**Course Description:** Focus on professional development skills important for success. Topics include research presentations, time management, mentoring, networking, constructive critique, and others.

**Prerequisite:** None.

**Restriction:** Must be a: Graduate.

**Registration Information:** Sections may be offered: Online. Credit not allowed for both HORT 500 and HORT 581A4.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 511 Green Roof Culture Credits: 3 (3-0-0)**

**Course Description:** Understand the relevance of green roofs in North America, especially the process, from concept to project completion and maintenance.

**Prerequisite:** HORT 100 to 199 - at least 3 credits.

**Registration Information:** Offered as an online course only.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 515 Urban Horticulture Credits: 3 (3-0-0)**

**Also Offered As:** AGRI 515.

**Course Description:** Investigate and evaluate the techniques of incorporating food production systems in the urban and peri-urban environment.

**Prerequisite:** HORT 451 or HORT 453.

**Registration Information:** Credit not allowed for both AGRI 515 and HORT 515. Offered as an online course only.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 521 Horticulture and Human Health and Well-Being Credits: 3 (3-0-0)**

**Course Description:** Impact of principles and practices of horticulture on human health and well-being.

**Prerequisite:** None.

**Restriction:** Must be a: Graduate.

**Registration Information:** Graduate standing. Sections may be offered: Online.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 522 Horticulture and Human Health Issues Credits: 3 (3-0-0)**

**Course Description:** Horticulture is an essential instrument of public health, but often professionals in these fields view themselves as opponents. Examine issues arising in the production of foods for human consumption that human health professionals often encounter. Overcome the barriers that divide horticulture and human health professionals.

**Prerequisite:** None.

**Restriction:** Must be a: Graduate.

**Registration Information:** Graduate standing. Sections may be offered: Online.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 523 Screening Crops for Human Health Traits Credits: 3 (3-0-0)**

**Course Description:** Principle and methods of screening food crops for traits related to human health.

**Prerequisite:** HORT 521.

**Restriction:** Must be a: Graduate.

**Registration Information:** Graduate standing. Written consent of instructor. Sections may be offered: Online.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 524 Food Pharmacology, Horticulture, and Health Credits: 3 (3-0-0)**

**Course Description:** Application of the principles of pharmacology to the production of food combinations that promote human health. Horticultural food crops are emphasized.

**Prerequisite:** HORT 522.

**Restriction:** Must be a: Graduate.

**Registration Information:** Graduate standing. Written consent of instructor. Sections may be offered: Online.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 571 Soil-Plant-Water Relations/Water Stress Credits: 3 (3-0-0)**

**Course Description:** Movement of water in the soil-plant-atmosphere continuum. Instrumentation for measuring plant-water relations. Plant responses to drought and salinity.

**Prerequisite:** BZ 440.

**Term Offered:** Spring (even years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 576 Advanced Environmental Plant Stress Physiology Credits: 4 (3-0-1)**

**Course Description:** Advanced aspects of plant growth, development and physiology, major sources of stress in plants, global issues in environment and plant stress.

**Prerequisite:** BZ 440.

**Registration Information:** Must register for lecture and recitation. Credit not allowed for both HORT 576 and HORT 476.

**Term Offered:** Spring (odd years).

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 578 Phytochemicals and Probiotics for Health Credits: 3 (2-0-1)**

**Also Offered As:** FTEC 578.

**Course Description:** Examination of phytochemicals and probiotic organisms important in human health.

**Prerequisite:** BC 351.

**Registration Information:** Senior standing. Must register for lecture and recitation. Credit not allowed for both FTEC 578 and HORT 578.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 579 Mass Spectrometry Omics-Methods and Analysis Credits: 3 (3-0-0)**

**Course Description:** A survey of experimental designs and workflows to generate, computationally process and analyze metabolite and protein data using mass spectrometry. Course format includes lecture, computer homework assignments with real data, literature review, and student presentations.

**Prerequisite:** BC 351.

**Registration Information:** Senior standing. Credit not allowed for both HORT 579 and HORT 581A3.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 588 Supervised Extension Practices Credits: Var[1-18] (0-0-0)**

**Course Description:** Field experiences in extension practices in horticulture.

**Prerequisite:** None.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 600 Topics in Horticulture Credits: 3 (3-0-0)**

**Course Description:** Explore major themes in horticulture and provide a broader understanding beyond research focus. Weekly discussions and readings are centered around the core topics of research in horticulture and landscape architecture.

**Prerequisite:** None.

**Restriction:** Must be a: Graduate, Professional.

**Registration Information:** Sections may be offered: Online. Credit not allowed for both HORT 600 and HORT 680A1.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**HORT 698 Research Credits: Var[1-18] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Restriction:** Must be a: Graduate, Professional.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 699 Thesis Credits: Var[1-18] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Restriction:** Must be a: Graduate, Professional.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**HORT 784 Supervised College Teaching Credits: Var[1-18] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Instructor Option.**Special Course Fee:** No.**HORT 792 Seminar Credit: 1 (0-0-1)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Sections may be offered: Online.**Terms Offered:** Fall, Spring.**Grade Mode:** Instructor Option.**Special Course Fee:** No.**HORT 795 Independent Study Credits: Var[1-18] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Instructor Option.**Special Course Fee:** No.**HORT 799 Dissertation Credits: Var[1-18] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Instructor Option.**Special Course Fee:** No.

## Landscape Architecture (LAND)

**LAND 110 Introduction to Landscape Architecture Credits: 3 (1-2-1)****Course Description:** Introductory theories, methods, and applications of landscape studies.**Prerequisite:** None.**Registration Information:** Must register for lecture, laboratory, and recitation.**Term Offered:** Fall.**Grade Mode:** Traditional.**Special Course Fee:** No.**Additional Information:** Arts & Humanities 3B.**LAND 120 History of the Designed Landscape Credits: 3 (3-0-0)****Course Description:** Major monuments and spaces from ancient Middle East through classical antiquity, the Renaissance, and Western tradition.**Prerequisite:** None.**Term Offered:** Spring.**Grade Mode:** Traditional.**Special Course Fee:** No.**LAND 192 Orientation to Horticulture/Landscape Arch Credit: 1 (0-0-1)****Also Offered As:** HORT 192.**Course Description:** First year course in horticulture and landscape architecture. Information and skills necessary to succeed in majors in the Department of Horticulture and Landscape Architecture.**Prerequisite:** None.**Restriction:** Must be a: Undergraduate.**Registration Information:** This is a partial semester course. Credit not allowed for both HORT 192 and LAND 192.**Term Offered:** Fall.**Grade Mode:** Traditional.**Special Course Fee:** No.**LAND 200 Topics in Landscape Theory and Garden Design Credits: 3 (3-0-0)****Course Description:** Landscape theory and design principles in garden design. Students will be engaged through online discussions and will record weekly exercises and course material with the development of a sketchbook and blog/website postings.**Prerequisite:** None.**Registration Information:** This is a partial semester course. Offered as an online course only.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Traditional.**Special Course Fee:** No.**LAND 220 Fundamentals of Ecology (GT-SC2) Credits: 3 (3-0-0)****Also Offered As:** LIFE 220.**Course Description:** Interrelationships among organisms and their environments.**Prerequisite:** (BIO 100 to 199 - at least 3 credits or BZ 100 to 199 - at least 3 credits or LIFE 100 to 199 - at least 3 credits or HORT 100) and (MATH 100 to 199 - at least 3 credits).**Registration Information:** Sections may be offered: Online. Credit allowed for only one of the following: F 209, LAND 220, LIFE 220 or LIFE 320.**Term Offered:** Fall.**Grade Mode:** Traditional.**Special Course Fee:** No.**Additional Information:** Biological & Physical Sciences 3A, Natural & Physical Sciences w/o lab (GT-SC2).**LAND 230 Drawing the Landscape Credits: 4 (2-4-0)****Course Description:** Visual communication techniques; exploration of symbology, model building, design development drawing, and construction documentation draughting.**Prerequisite:** None.**Registration Information:** Must register for lecture and laboratory.**Term Offered:** Fall.**Grade Mode:** Traditional.**Special Course Fee:** No.**LAND 240 Fundamentals of Landscape Design Process Credits: 4 (1-4-1)****Course Description:** Initiation of formal exploration of design elements, materials, and principles, and introduction of design process as a defensible methodology.**Prerequisite:** LAND 230.**Registration Information:** Must register for lecture, laboratory and recitation.**Term Offered:** Spring.**Grade Mode:** Traditional.**Special Course Fee:** Yes.



**LAND 241 Environmental Analysis Credits: 3 (1-4-0)**

**Course Description:** Exploration and understanding of natural and cultural landscapes through analytical simulation techniques.

**Prerequisite:** LAND 230.

**Registration Information:** Must have concurrent registration in LAND 240. Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 250 Geospatial Methods for Landscape Architecture Credits: 3 (2-2-0)**

**Course Description:** Concepts and techniques used in geographic information systems (GIS) in the practice of landscape architecture and urban design, with an emphasis on professional applications and geospatial design assessment and decision-making (a.k.a. geodesign).

**Prerequisite:** LAND 110.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 357 Omnibus Field Studies Credits: 4 (0-8-0)**

**Course Description:** Theories and methods for the analysis, design, and planning of garden and landscape scale environments.

**Prerequisite:** None.

**Registration Information:** 3 credits in landscape drawing and analysis.

**Term Offered:** Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**LAND 360 Basic Landscape Design and Construction Credits: 3 (0-6-0)**

**Course Description:** Site programming analysis, design, and construction, including skill development in specifying earthwork, drainage, and vegetative composition.

**Prerequisite:** LAND 240.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**LAND 361 Digital Methods Credits: 3 (2-2-0)**

**Course Description:** Landscape research, analysis, and design with ARCVIEW, AutoCAD, Microstation, and Photoshop.

**Prerequisite:** LAND 360, may be taken concurrently.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 362 Form and Expression in Garden Design Credits: 3 (0-6-0)**

**Course Description:** Formal decision making for site scale environments, including creative processes for form-giving, and generation of experimental solutions.

**Prerequisite:** LAND 361.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 363 Advanced Landscape Site Engineering Credits: 4 (2-4-0)**

**Course Description:** Understanding and documenting the built environment with emphasis on construction and surveying as integral parts of design process.

**Prerequisite:** LAND 360.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**LAND 364 Design and Nature Credits: 4 (1-6-0)**

**Course Description:** Computer-aided processes for siting, organizing, and evaluating cultural activities within ecologically fragile, landscape-scale environments.

**Prerequisite:** LAND 361.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 365 Landscape Contract Drawing and Specifications Credits: 3 (2-2-0)**

**Course Description:** Construction details, design development, and construction documentation emphasizing implementation of design projects.

**Prerequisite:** LAND 363.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 366 Landscape Design Expression Credits: 4 (0-8-0)**

**Course Description:** Idea, values, and process landscape form applied to interactions of natural, cultural systems at the site and community scale; design competitions.

**Prerequisite:** LAND 365.

**Registration Information:** Credit not allowed for both LAND 366 and LAND 376.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 368 Landscape Irrigation and Water Conservation Credits: 3 (2-2-0)**

**Also Offered As:** HORT 368.

**Course Description:** Practical approaches and methods of irrigation, water conservation, and water management in the designed landscape.

**Prerequisite:** LAND 110 or HORT 100.

**Registration Information:** Credit not allowed for both LAND 368 and HORT 367 or HORT 368. Must register for lecture and laboratory.

**Terms Offered:** Fall, Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 376 Landscape Design and Visualization Credits: 4 (0-8-0)**

**Course Description:** Precedents, ideas, values and processes of landscape form applied to landscape systems at the site and community scale; design competitions.

**Prerequisite:** LAND 362.

**Registration Information:** Credit not allowed for both LAND 376 and LAND 366. Required field trips.

**Term Offered:** Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**LAND 384 Supervised College Teaching Credits: Var[1-5] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Registration Information:** A maximum of 10 combined credits for all 384 and 484 courses are counted towards graduation requirements.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**LAND 392 Seminar-Designed Landscapes-Theory and Criticism Credits: 2 (0-0-2)**

**Course Description:** Readings, discussions, and writing in landscape architectural design theory; critical analysis of the designed and constructed landscape.

**Prerequisite:** LAND 365.

**Term Offered:** Fall.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**LAND 444 Landscape Ecology Credits: 3 (3-0-0)**

**Course Description:** Exploration of the spatial patterns and processes of large-scale and regional landscapes, interactions between natural and human-modified landscapes, and the impacts of various development patterns on the well-being of ecosystems, wildlife populations, and human communities.

**Prerequisite:** LAND 220 or LIFE 220 or LIFE 320.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 446 Urban Design Credits: 4 (0-8-0)**

**Course Description:** Designing the urban landscape, including precedent exploration about overall image, materials, and structure of the city and its components.

**Prerequisite:** LAND 366.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**LAND 447 Comprehensive Landscape Design Credits: 4 (0-8-0)**

**Course Description:** Terminal studio; research, analysis, and synthesis for comprehensive project identified by student and approved in advance by faculty committee.

**Prerequisite:** LAND 446.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 449 Professional Practice Credit: 1 (1-0-0)**

**Course Description:** Theory and skills of landscape architectural professional practice including functional, human, business, legal, and political aspects.

**Prerequisite:** LAND 447, may be taken concurrently.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 454 Landscape Field Studies Credits: 5 (1-6-1)**

**Course Description:** Field observation of spatial and temporal landscape patterns resulting from natural and cultural processes and interactions.

**Prerequisite:** LAND 366.

**Term Offered:** Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** Yes.

**LAND 455 Travel Abroad-European Landscape Architecture Credits: 5 (1-6-1)**

**Course Description:** Exploration of major theoretical platforms in design through drawing, photographing, and measuring landscape architecture precedents in Europe.

**Prerequisite:** LAND 362.

**Term Offered:** Summer.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 495A Independent Study: Design Projects Credits: Var[1-4] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**LAND 495B Independent Study: Field Service Credits: Var[1-4] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Terms Offered:** Fall, Spring, Summer.

**Grade Mode:** Instructor Option.

**Special Course Fee:** No.

**LAND 496 Group Study Credits: Var[1-8] (0-0-0)**

**Course Description:**

**Prerequisite:** None.

**Registration Information:** Maximum of 8 credits allowed in course.

**Terms Offered:** Fall, Spring, Summer.

**Grade Modes:** S/U within Student Option, Trad within Student Option.

**Special Course Fee:** No.

**LAND 510 Virtual Design Methods Credits: 3 (2-2-0)**

**Course Description:** Exploration and application of advanced computing technology and methods for analyzing and organizing natural and cultural landscapes.

**Prerequisite:** None.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Fall.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 520 Geographic Information Systems Credits: 3 (1-4-0)**

**Course Description:** Theories and applications of geographic information systems in spatial analysis and land planning.

**Prerequisite:** LAND 241.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 560 Structure of Landscape Patterns Credits: 3 (2-2-0)**

**Course Description:** Mechanisms and concepts in landscape structure for planning, design, and environmental management.

**Prerequisite:** LIFE 320.

**Registration Information:** Must register for lecture and laboratory.

**Term Offered:** Spring.

**Grade Mode:** Traditional.

**Special Course Fee:** No.

**LAND 695A Landscape Architectural Independent Study: Design****Projects Credits: Var[1-4] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Traditional.**Special Course Fee:** No.**LAND 695B Landscape Architectural Independent Study: Field****Service Credits: Var[1-4] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Traditional.**Special Course Fee:** No.**LAND 698 Research Credits: Var[1-5] (0-0-0)****Course Description:** Guided research experience in landscape architecture.**Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** S/U Sat/Unsat Only.**Special Course Fee:** No.